

Tuberculosis, HIV, and silicosis screening in an artisanal and small-scale alluvial gold mining community in Mwenezi district, Zimbabwe

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INTRODUCTION

There is a growing global concern regarding the health and safety of artisanal and small-scale miners (ASMs), particularly in relation to mercury exposure, injuries and accidents, tuberculosis (TB), and silicosis.¹⁻³ Artisanal and small-scale miners work in conditions that expose them to multiple health and safety hazards.⁴ Globally, there are more than 45 million ASMs; more than 10 million are in Africa.⁵⁻⁶ Artisanal and small-scale miners are a vulnerable group due to archaic mining methods, poor health and safety practices, and operation in remote and hard-to-reach areas, which are underserved by health services.

Women and girls involved in artisanal and small-scale gold mining are more vulnerable than their male counterparts, due to gendered differences in occupational health and safety (OHS) that include employment patterns, cultural beliefs, societal roles, expectations, responsibilities, and a male-dominated mining sector.⁷ Gendered OHS issues in ASMs are multiple, significant, and often not comprehensively addressed. Women and men are differentially exposed to occupational hazards due to their anatomical and biological differences. Access to health services, including maternity services, is very limited for women due to both travel costs and long distances from the nearest health facility. The Ministry of Health and Childcare (MoHCC) in Zimbabwe, with support from the United States Agency for International Development (USAID), introduced a health screening programme under the Kunda Nqob'i

ABSTRACT

Artisanal and small-scale alluvial gold mining in Zimbabwe is a common economic activity in Mwenezi district. In most artisanal and small-scale mining areas, there is lack of access to occupational health services. A five-day mobile occupational health screening service was offered in Mwenezi district with the aim of providing health screening services to artisanal and small-scale alluvial gold miners (ASAGMs) and community members; 68 ASAGMs and 81 community members were screened for tuberculosis (TB). The ASAGMs were predominantly female ($n = 38$; 55.9%). Four cases of TB were diagnosed among the community members. No silicosis or TB cases were diagnosed among the ASAGMs. Eight (11.8%) ASAGMs were HIV-positive. Almost half ($n = 15$; 42%) of the screening audiometry tests showed impaired hearing. The local health staff reported that ASAGMs in the region lack access to occupational health services and were constrained by financial costs to travel for screening for occupational health diseases. Unlike in most artisanal and small-scale mining in Zimbabwe, which is male-dominated, Mwenezi district had more women who accessed the five-day mobile occupational health screening services. Providing mobile occupational health services in remote mining sites improves access to healthcare services for both women and men.

TB (KNTB) Project for tuberculosis (TB), human immunodeficiency virus (HIV) and silicosis, specifically for ASMs. One of the key focus areas of the KNTB Project is women in artisanal and small-scale alluvial gold mining. Generally, artisanal and small-scale alluvial gold mining is male-dominated in Zimbabwe. Mwenezi district is unique in that more women than men are involved in alluvial gold mining. The aim of this report is to highlight the experiences and lessons learnt in providing outreach services for TB, HIV and silicosis screening targeted at women and men in artisanal and small-scale alluvial gold mining in Mwenezi district, Zimbabwe.

The aim of the occupational health outreach service was to provide health screening services for TB, HIV, occupational lung diseases (OLDs), and other health conditions.

METHODS

Baines Occupational Health Services (BOHS), one of the implementing partners of the KNTB Project, provided a five-day mobile occupational health outreach service at Lundi Clinic in Mwenezi district from 8 to 12 April 2024. Mwenezi district is located to the south of Masvingo province, Zimbabwe, and shares boundaries with Beitbridge in the south, Chivi in the north, Mberengwa in the west, and Chiredzi in the east. The district has a population of 209 327.⁸ Artisanal and small-scale alluvial gold mining is one of the key economic activities in the district, which has 24 health facilities, with two TB diagnosing centres at

Neshuro District Hospital and Matibi Mission Hospital. These two hospitals are the only health facilities with onsite radiological services. Not all the health facilities in the district offer occupational health services.

A week prior to conducting the outreach activity, a two-day sensitisation and mobilisation service was carried out in the surrounding artisanal and small-scale alluvial gold mining areas in the Mwenzi district. This was conducted by representatives from the MoHCC district TB and leprosy programme office, a representative from the artisanal small-scale alluvial gold miners' (ASAGMs) leadership, Jointed Hands Welfare Organisation (JHWO), which is a community-based organisation, and two representatives from BOHS. The mobilising team played several roles that included i) informing the ASAGMs about the forthcoming health screening activity, and describing the process, benefits and key logistics for screening, ii) distributing posters and pamphlets about the event, (iii) establishing rapport with the ASAGMs, and (iv) assessing the road infrastructure and suitable camping sites for the mobile outreach service at Lundi Clinic, a public health facility.

The mobile outreach service consisted of a digital X-ray machine, audiometer, spirometer, basic medical equipment for assisting with clinical consultations, and a medical team comprising occupational health experts and a radiographer from BOHS, and health workers from Lundi Clinic. Health screening was voluntary.

The health service package included:

- Radiology services for screening for TB and OLDs
- An HIV voluntary counselling and testing centre
- Pure-tone air conduction audiometry
- Spirometry
- Health and safety talks on safe mining practices and fundamental information on TB and OLDs
- Physical examinations
- Sputum collection for Xpert *Mycobacterium tuberculosis* rifampicin resistance (Xpert MTB/RIF) testing

Health registers, including TB registers, TB preventive therapy registers, and health attendance registers from Lundi Clinic were used to capture routine demographic and clinical data according to the MoHCC guidelines. All diagnosed TB cases were recorded in the TB register at Lundi Clinic.

RESULTS

Over the five-day period, 149 ASAGMs and community members were screened for TB (Table 1). Of these, 81 (54.3%) were from the general mining community and 68 (45.6%) were ASAGMs. The ASAGMs were predominantly female (n = 39; 57.0%). None of the 68 ASAGMs who were screened for TB and the 60 who were screened for silicosis had either of the two diseases. Of the 49 ASAGMs with known HIV status, eight (16.0%) women were HIV-positive; all the men were HIV-negative. Four participants from the community were diagnosed with TB, one of whom had the TB bacteriologically confirmed (Xpert MTB/RIF positive). Two (6.0%) of the 50 spirometry tests were abnormal, showing a mild restrictive lung defect. Fifteen (42.9%) of the 35 screening audiometry tests done on the ASAGMs were abnormal and required further diagnostic audiometry.

The Mwenzi district TB coordinator, environmental health technician (EHT), local clinic nurse and ASAGMs shared key comments on the occupational health outreach service. The TB coordinator expressed strong support for the project and highlighted that it had improved access to TB and OLD screening, especially for women.

"The ability to conduct on-site TB, HIV and silicosis screenings has been a game-changer, enabling early detection and linkage to care for these vulnerable communities. By extending the radiology screening activity to additional sites, the project would be able to reach a larger proportion of the ASAGMs' population and have an even greater impact on addressing the significant burden of TB and silicosis in these communities."

The EHT noted the importance of the outreach health screening service.

"With these new diagnoses, the local health team can now conduct aggressive contact tracing and follow-up to ensure prompt linkage to treatment and care for both the index cases and their close contacts. This proactive approach, facilitated by the radiology screening programme, is crucial for interrupting the chain

Table 1. Tests conducted and findings in attendees of the health screening service (N = 149)

Test/finding	Attendees	Sex				All n
		Male		Female		
		n	%	n	%	
TB screening	ASAGMs and community members	DND	-	DND	-	81
TB diagnosed	community members	DND	-	DND	-	4
TB screening	ASAGMs	29	42.6	39	57.4	68
Presumed TB	ASAGMs	3	60.0	2		5
TB diagnosed	ASAGMs	0	-	0	-	0
Silicosis screening	ASAGMs	27	45.0	33		60
Silicosis diagnosed	ASAGMs	0	-	0	-	0
Eligible for TB preventive therapy	ASAGMs	0	-	0	-	0
Silico-TB diagnosed	ASAGMs	0	-	0	-	0
HIV tests conducted	ASAGMs	21	42.9	28	57.1	49
HIV diagnosed	ASAGMs	0	-	8	100.0	8
Spirometry tests	ASAGMs	26	52.0	24	48.0	50
Audiometry tests	ASAGMs	15	42.9	20	57.1	35

DND: data not disaggregated as the information was not captured on the data proforma

ASAGMs: artisanal and small-scale alluvial gold miners, HIV: human immunodeficiency virus, TB: tuberculosis



Figure 1. Women and girls involved in alluvial mining along the Runde River

Photograph: Blessings Chigaraza

of TB transmission and preventing the disease from spreading more widely throughout the ASAGMs' communities and beyond. By addressing these multiple health concerns simultaneously, the project is able to provide a comprehensive package of services that addresses the complex health needs of the ASM population."

The local clinic nurse expressed how the outreach facility had removed access barriers to TB and OLDs diagnosis.

"The free nature of the screening and treatment has been remarkable, removing the financial barriers that often prevent marginalised groups from seeking care. ASAGMs and their families have expressed deep relief and appreciation for the opportunity to undergo comprehensive screening and receive necessary treatment and follow-up care at no cost to them."

During the sensitisation and mobilisation activities, the team observed a number of occupational hazards at the worksites, including ergonomic hazards where women engaged in alluvial mining by the Runde River spent long hours standing in water – often in awkward positions – performing tasks that lead to repetitive musculoskeletal motions (Figure 1). Young women and girls were observed engaging in alluvial gold mining alongside older women.

DISCUSSION

Artisanal and small-scale mining in Mwenezi district is predominantly alluvial and mostly carried out by women along the Runde River. There were no recorded cases of TB or silicosis among the ASAGMs who were screened. There is a high burden of hearing impairment among artisanal miners in Mwenezi district. Women are exposed mainly to ergonomic hazards.

This report shows that, in Mwenezi district, women are more involved in alluvial mining than in other districts such as Kwe Kwe, Shurugwi, Gwanda, Insiza, and Zvishavane, where mining

is predominantly underground and male miners far outnumber women. We found that women involved in alluvial mining have a lower burden of TB, HIV and OLD compared to ASAGMs working in underground mines.³⁻⁴ The high level of hearing impairment amongst the miners in Mwenezi is similar to miners in a gold mining community in Nicaragua who had poor hearing.⁹ Female ASAGMs in Mwenezi district are exposed to significant ergonomic hazards in similar ways to women engaged in artisanal gold mining in the Democratic Republic of Congo and Uganda.⁶⁻⁷ Studies on ASAGMs in other districts in Zimbabwe have also noted that delivering occupational health services through a mobile outreach approach significantly removes barriers associated with access to healthcare services.^{1,3}

CONCLUSION

Delivering occupational health services for TB, HIV and silicosis screening, and other tests through an outreach approach removes barriers of access to care for women in alluvial gold mining. Women in alluvial gold mining in Mwenezi district have a lower burden of TB, HIV and silicosis than their male counterparts in the districts of Shurugwi, Kwe Kwe and Gwanda, but there is an urgent need to address ergonomic hazards. More mobile occupational health outreach services should be provided in areas in which there is artisanal and small-scale alluvial gold mining.

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